

# Public Use of Private Sector GPS Truck Data

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# Public Agencies Need Truck Data

- Most of the nation's freight is moved by trucks.
- Beyond roadside volume counts, public agencies have minimal truck data.
- The private sector has GPS truck fleet data. How should public agencies acquire this data?
- **You buy it.**

# Commercial Fleet Management GPS

- Numerous vendors sell GPS services to trucking companies (Trimble, Qualcomm, etc).
- Used to track and dispatch trucks, monitor driver performance, etc. (They report using a cell connection.)
- One estimate is 25% of trucks have these GPS.
- A “waste” product of the trucking industry.
- A rich source of data across North American – used in Ontario and by FHWA (ATRI).

# Washington State and GPS Truck Data

- Washington state has a performance measures program using this truck GPS data to:
  - Quantify bottlenecks and guide funding requests.
  - Increase accountability by tracking truck performance before and after projects are constructed.
- Program initially in the central Puget Sound region – now a statewide program.

# Buying Truck GPS Data from Individual Businesses

- In Washington State, trucking and freight firms agreed to provide their daily GPS data at no cost.
- It did not work because:
  - Sharing data low priority for a business.
  - Lack of technical support.
  - Many different data formats and data feeds required.
  - Multiple types of data agreements would be needed.

# Buying Truck GPS Data from Vendors Worked

- GPS vendors are starting to realize selling data is a new revenue stream.
- One-stop shopping – one GPS vendor includes a large number of trucking businesses.
- Good technical support from the vendors for pushing out the data.
- Relatively inexpensive (compared to a research oriented data collection program).
  - Around \$0.20 to \$0.50 a truck a day.

# But Buying Truck GPS Data

- Requires contracts which can be complicated and time consuming.
  - Attorneys are involved.
- Privacy of the truckers is a major concern.
  - Requires non-disclosure agreements.
  - Limits your ability to distribute disaggregated results and to share data.
- You need a budget.

# The Commercial GPS Data

- Includes at least: lat/long, time/date stamp, travel direction, instantaneous speed, truck ID.
- The data is collected for trucking company business needs and not for public sector use.
  - Due to cellular cost, the truck's location report are often infrequent (2 to 15 minutes).
- But one vendor can provide many trucks.
- The data model is many trucks with infrequent reads (as opposed to a few trucks with many reads).



# Other Data Issues

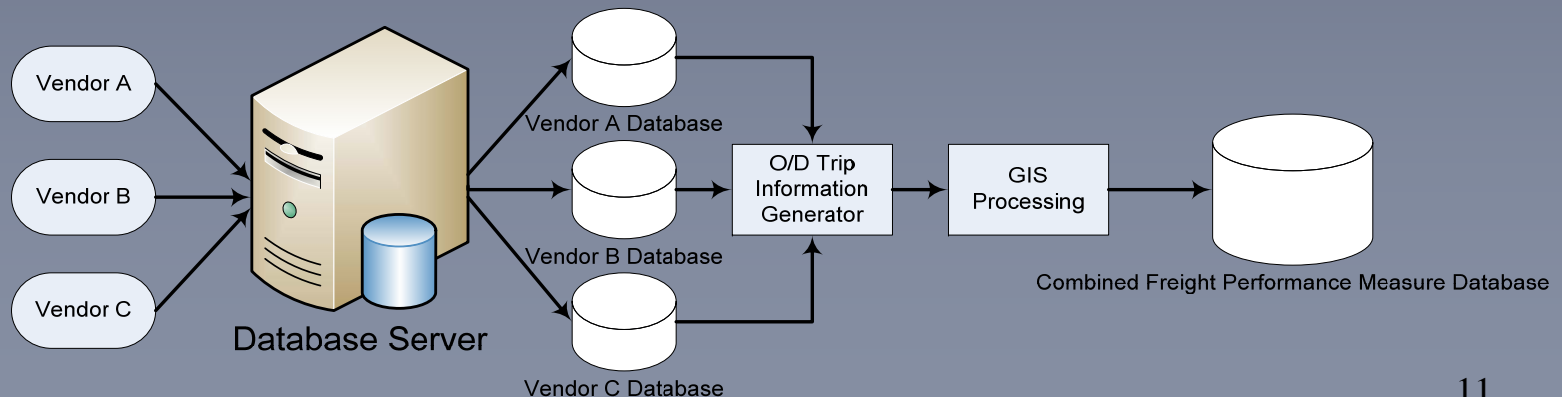
- Setting up a automated data processing mechanism is necessary since the database includes millions of points.
- Due to privacy protection - you do not know the truck's size, class, or cargo.
- The raw data requires considerable processing:
  - Error checking.
  - Fixing GPS signal problems.
  - Geo-locating in a GIS to roadway.
  - Locating trip origins and destinations.

# Data Acquisition - Puget Sound Region

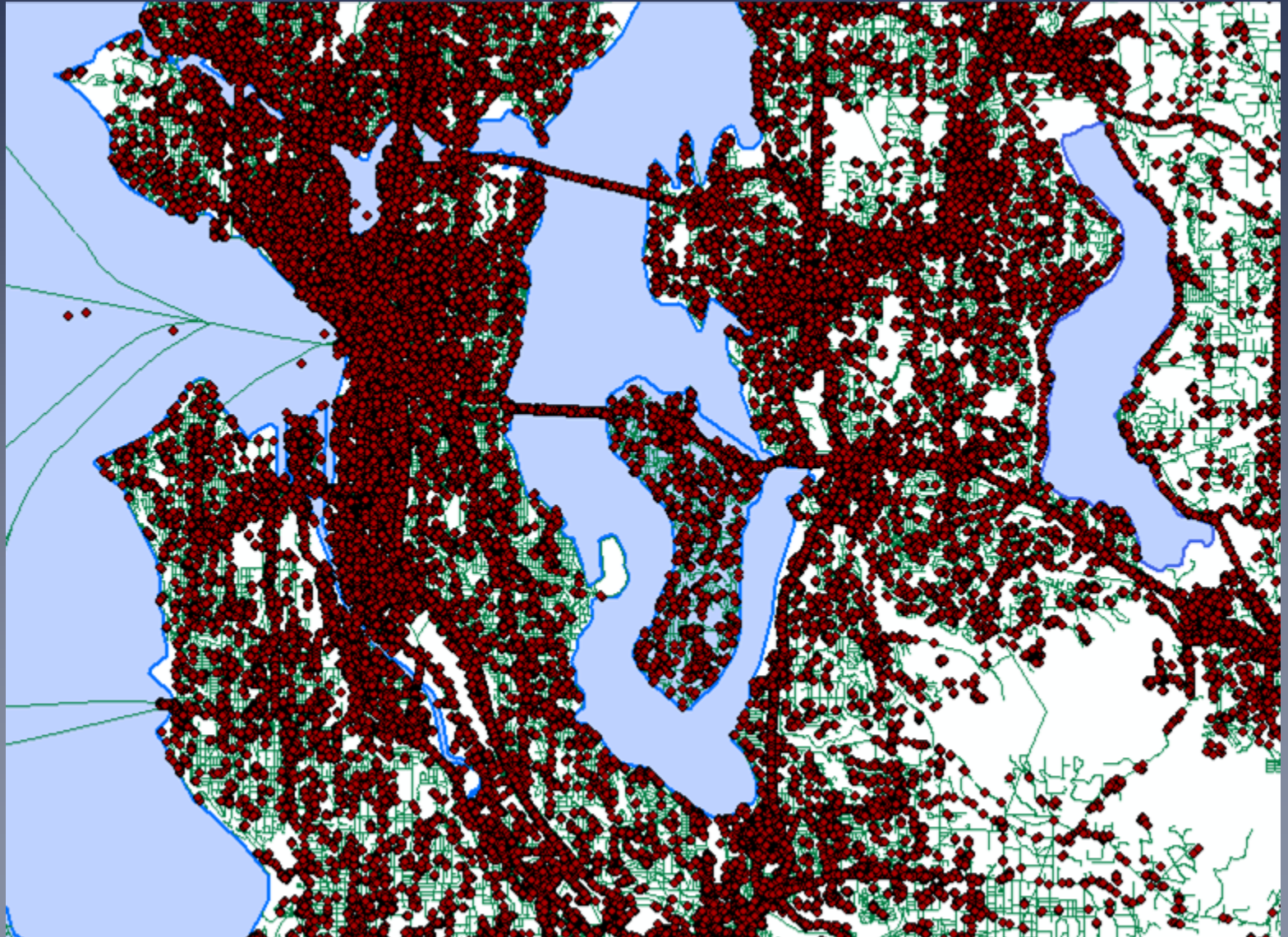
GPS Vendors	Average Total Daily Records	Total Trucks	Frequency of reads (minutes)	Data type
Vendor A	94,000	Approx 2,500 per day	5-15	In-vehicle GPS with a cellular connection
Vendor B	12,000	25	0.5	In-vehicle GPS with a cellular connection
Vendor C	3,000	60	1-5	GPS cell Phone

# Washington State - Data Collection Process

- Each dataset required a custom connection developed in cooperation with the GPS vendor's technical staff.
- The automated database handles large quantities of data – we have been collecting data for more than a year.

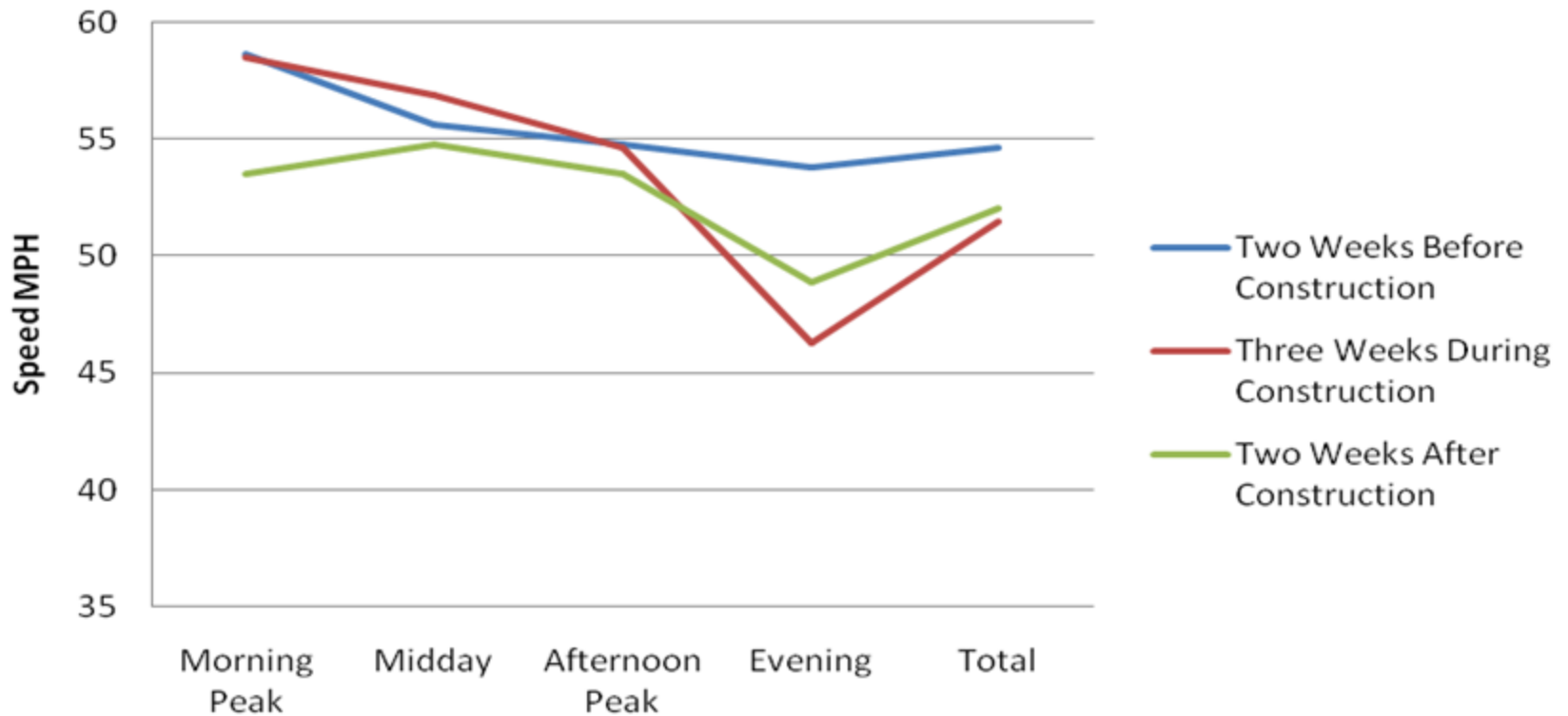


# Data Acquisition - One Week of Data



# The Value of the GPS Data - Explore Construction Impacts

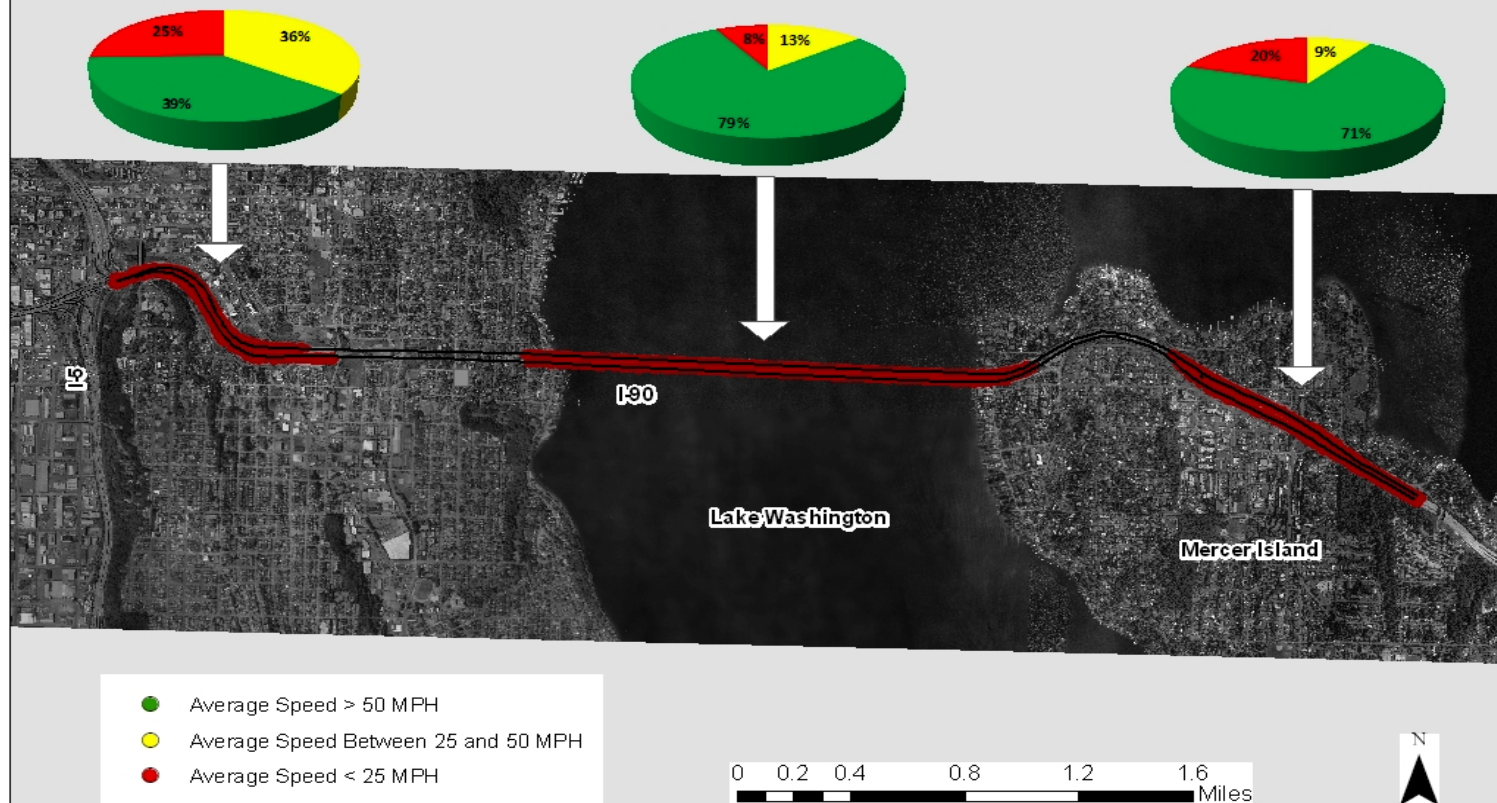
## I-90 Eastbound Average Truck Speeds by Time Period





# The Value of the GPS Data - Identify Truck Bottlenecks

**I-90 GPS WESTBOUND TRUCK SPEEDS: ONE YEAR OF READS**



September 2008 to September 2009

# Extend the Value of the Data

- Recognize there will be better data as more truckers install GPS devices and as location read rates improve.
- Develop a relationship with GPS vendors and work with them to develop more value – they are willing.
- Support other uses of the data such as developing freight models.
  - Better network assignment.
  - Trip generation (Puget Sound Regional Council, for example).
  - Quantifying zone to zone freight movements.
  - Air quality modeling.

# Extending the Value of the Data

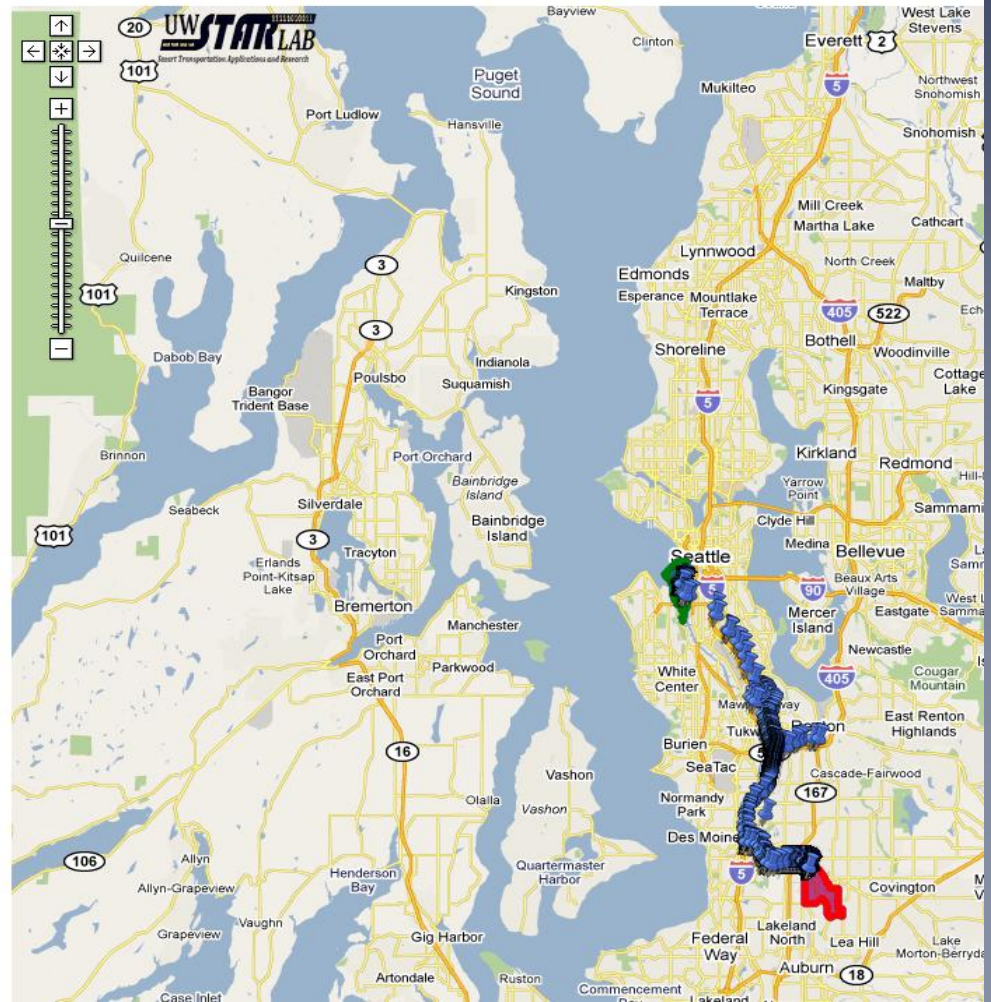
## Interactive Database

### DRIVE Net | *Digital Roadway Interactive Visualization and Evaluation Network*

#### Freight Performance Measures [\(Back\)](#)

Total Access Trips: 469  
Average Travel Time: 33.2 min.  
Travel Time Variance: 4.8 min.  
95 percentile Travel Time: 42.5 min.  
Average Travel Speed: 36.2 mph  
Travel Speed Variance: 4.2 mph  
Average Travel Distance: 19.7 mile  
Planning Time Index: 1.4  
Travel Time Index: 1.1  
Buffer Time Index: 1.3  
Free-Flow Travel Time: 31.3 min.  
Free-Flow Travel Speed: 37.7 mph  
Minimum Sample Size: 6  
Total AM Trips: 54  
Average AM Travel Time: 32.7 min.  
Average AM Travel Speed: 36.3 mph  
Total Mid Trips: 125  
Average Mid Travel Time: 37.1 min.  
Average Mid Travel Speed: 32.6 mph  
Total PM Trips: 123  
Average PM Travel Time: 33.4 min.  
Average PM Travel Speed: 35.9 mph  
Total Evening Trips: 76  
Average Evening Travel Time: 30.8 min.  
Average Evening Travel Speed: 38.5 mph  
Total Overnight Trips: 81  
Average Overnight Travel Time: 30.1 min.  
Average Overnight Travel Speed: 39.5 mph  
Total Weekend Trips: 10  
Average Weekend Travel Time: 30.3 min.  
Average Weekend Travel Speed: 39.5 mph.

Show GPS Points





# Summary – Use of Private GPS Data

It's efficient to contract with vendors for truck GPS data

There are advantages:

- Each vendor collects data from many trucking companies.
- Technical support is available.
- You pay for the data so have a business relationship.
- The data will be improving with more trucks and better GPS devices.

And disadvantages to working with vendors:

- You have to pay for the data and protect privacy.
- Contracts and non-disclosure agreements are required, so attorneys are involved.
- Each source requires a different technical connection.
- The output data satisfy the trucking companies' needs - not the public sector's needs.

# Questions?

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